DOCUMENT RESUME

ED 051 607 EC 032 578

AUTHOR	Bruch, Catherine B.
TITLE	Social Sciences: Curriculum Guide for Teaching Gifted Children Social Sciences in Grades Four Through Six.
INSTITUTION	California State Dept. of Education, Sacramento. Div. of Special Education.
SPONS AGENCY	Bureau of Elementary and Secondary Education (DHEW/OE), Washington, D.C.
PUB DATE	70
NOTE	44p.
EDRS PRICE	EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS	Creative Development, *Curriculum Guides, *Exceptional Child Education, *Gifted, *Intermediate Grades, *Social Sciences
IDENTIFIERS	California

ABSTRACT

The curriculum guide is intended as an introduction to the study of man and his individuality, creativity, and uniqueness. Portions of such a study are suggested for use with gifted children in grades 4-6. Major objectives relate to the development by gifted students of their own creativity, productivity, and realization of personal potential. Behavioral objectives in the areas of learning skills, cognitive processes, and affective processes are enumerated, and guiding questions and activities for the study of creative man are suggested. Biographical sketches of creative men and women are presented to serve as bases for lessons. Tapescripts of some classroom discussions following use of lessons in the Men and Women of Ideas series are given. The thought processes involved, as reflected by the students' comments, are analyzed. Films about creative persons are listed, as are films which may be useful to teachers for inservice training. (KW)

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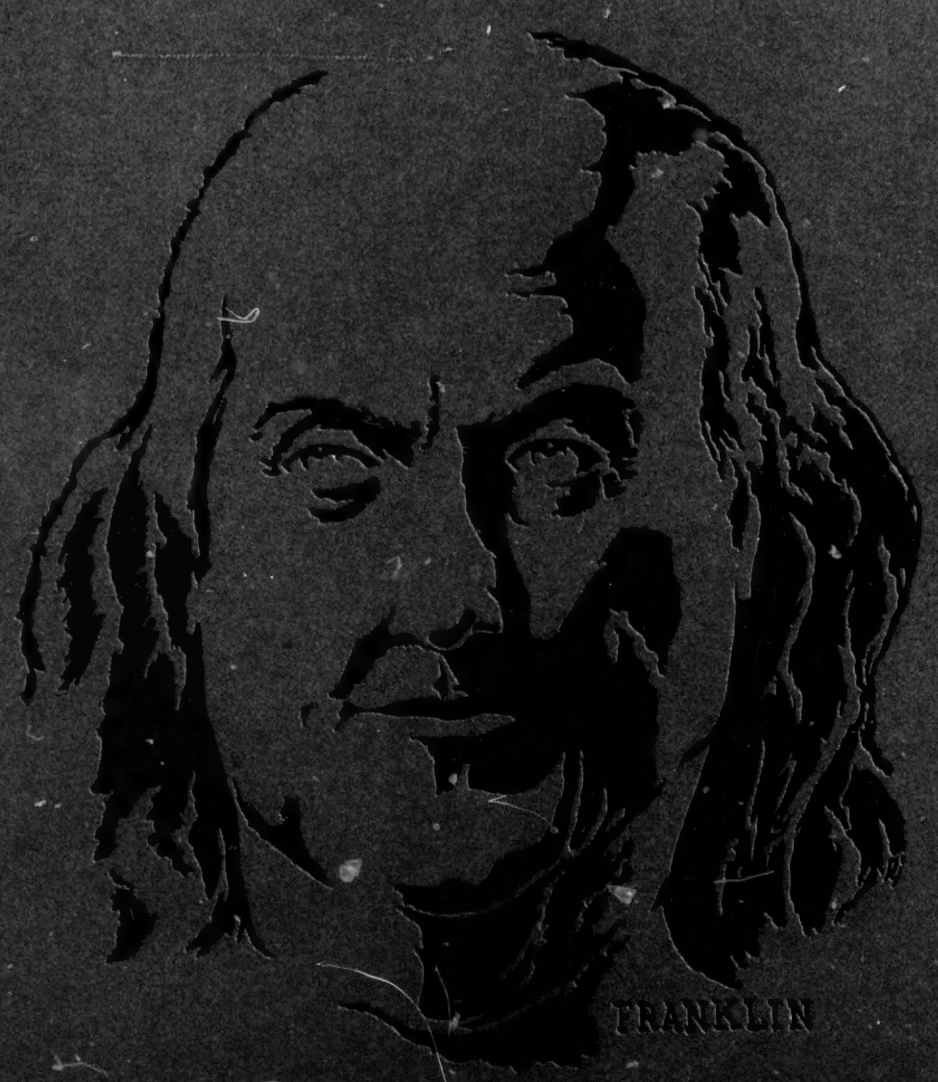

social sciences

CURRICULUM GUIDE FOR TEACHING GIFTED CHILDREN
SOCIAL SCIENCES IN GRADES FOUR THROUGH SIX

CALIFORNIA STATE DEPARTMENT OF EDUCATION
Max Rafferty · Superintendent of Public Instruction · Sacramento, 1970

EC032578

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CURRICULUM GUIDE FOR TEACHING GIFTED CHILDREN SOCIAL SCIENCES IN GRADES FOUR THROUGH SIX

Prepared for the
DIVISION OF SPECIAL EDUCATION
California State Department of Education

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ED021201

This publication, which was funded under provisions of the Elementary and Secondary Education Act, Title V, was edited and prepared for photo-offset production by the Bureau of Publications of the California State Department of Education, and published by the Department, 721 Capitol Mall, Sacramento, California 95814.

Printed by the Office of State Printing

1970

FOREWORD

California public schools should provide equal opportunity for every girl and boy of school age to become knowledgeable in the basic subjects and proficient in using the basic skills of learning. And the educational programs offered by the schools should be of sufficient scope and depth to permit each girl and boy to secure the special preparation needed for entering college or for beginning employment in occupational fields in which no more than high school graduation is required.

In conducting their educational programs, the schools must employ practices that are sufficiently flexible to permit the adjustments required to meet each pupil's need of special education. The talented are among those for whom such adjustments will be necessary. Recently the State Department of Education directed and coordinated a federally funded project for the development of curriculum materials of the type needed for this program. The materials reflect the best thinking of people who are well qualified both by education and by experience. They are both innovative and professional.

This curriculum guide, one of a series, is concerned with the teaching of the social sciences to mentally gifted pupils in grades four through six. The concepts and suggestions contained in this publication merit thoughtful attention, appropriate interpretation, and wise application.

Max Rafferty

Superintendent of Public Instruction

PREFACE

This curriculum guide is one of the products of an education project authorized and funded under provisions of the Elementary and Secondary Education Act, Title V. The guide is intended for use by the teachers of pupils whose mental ability is such that they are classified as mentally gifted.

Curriculum Guide for Teaching Children Social Sciences in Grades Four Through Six is one of a series of curriculum guides for use by teachers of the mentally gifted in grades one through three, four through six, seven and eight, and nine through twelve. The guides were prepared under the direction of John C. Gowan, Professor of Education, and Joyce Sonntag, his assistant, both of San Fernando Valley State College.

A curriculum framework for use chiefly by administrative and consultative personnel in developing programs for mentally gifted minors is another product of the education project. This framework was prepared under the direction of Mary N. Meeker, Associate Professor of Education, University of Southern California, and James Magary, Associate Professor of Educational Psychology, University of Southern California.

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Introduction

This curriculum guide, subtitled "Creative Man," is not intended to be a complete study of the topic of man and his individuality, creativeness, or uniqueness. The portions of such a study suggested within this guide are but introductory in nature. Depth and breadth of pursuit of the topic must be left to the innovations of teachers and their gifted students.

The guide has been written to reflect some of the concepts discussed by the author in the parallel *Teaching Gifted Children Social Sciences in Grades Four Through Six*.[1] Major objectives for the guide are centered on concepts related to the development by gifted pupils of their own creativity and productivity and, eventually, of their own realization of personal potential through contributions to humanity.

Through the more complete study of creative and productive persons, it is expected that the gifted students may begin to feel within themselves intrinsic motivation for being and becoming as individuals that which is their best self. A continuing study of "Creative Man" in both breadth and depth, if introduced in concentration in the intermediate grades, may significantly effect a change away from the recognized "fourth-slump" in creativity. If they begin to experience and feel the qualities portrayed by creative contributors to society, pupils may begin to find wealth and joy in their own productivity.

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[1]Catherine B. Bruch, *Teaching Gifted Children Social Sciences in Grades Four Through Six*. Sacramento: California State Department of Education (in press).

CHAPTER 1

Behavioral Objectives

The behavioral objectives that follow are directed toward the experiencing by pupils of their creative selves as well as toward more general social science objectives. The objectives should not be considered complete; they are only examples for elaboration by experimenters with the ideas presented in this guide. The objectives are categorized as follows:

Learning Skills

Learning skills include problem solving, attention, and initiative and independence.

A. Problem solving
   1. Applies problem-solving procedures gained from the social sciences to everyday situations
   2. Habitually checks multiple sources for information
   3. Risks tentative ideas for further development through discussion
   4. Formulates and attempts to check out hypotheses
   5. Shows unusual ability to organize complex tasks
   6. Pursues problem solving through systematic search to conclusions
   7. Follows through on his most productive ideas to satisfactory conclusions

B. Attention
   1. Demonstrates prolonged attention when working on independent investigations
   2. Tends to be difficult to distract when searching for complex answers
   3. Works beyond the designated time allotted for a task (e.g., into recess time) or undertakes self-assigned homework investigations

C. Initiative and independence
   1. Pursues self-initiated learning to greater depth than do his peers
   2. Displays evidence of curiosity and attempts experimentation
   3. Uses delays in classroom routine productively

Cognitive Processes

1. Utilizes complex cognitive processes of productive thinking (Guilford's "Structure of Intellect"; convergent production, divergent production, and evaluation; higher levels of Bloom's *Taxonomy I*; advanced abstraction levels)[1]
2. Tolerates longer periods of openness or ambiguity before seeking closure
3. Is an absorbed listener in discussions or challenging presentations of adults or peers
4. Raises penetrating questions beyond the minimal "need-to-know"
5. Examines objects closely, experimenting with various angles and possibilities
6. Challenges, compares, and perceives contradictions in ideas of authorities
7. Entertains bold new possibilities for finding solutions
8. Uses analogies in writing and speaking
9. Demonstrates flexibility through production of a variety of ideas
10. Interacts with adaptability to the ideas presented by others
11. Elaborates his own ideas to present adequate detail and rationale
12. Extends his own ideas and those of others ("piggy-backs" on ideas), deriving further inferences, syntheses, and implications
13. Finds relationships between apparently unrelated concepts across several subject disciplines
14. Synthesizes complex patterns of relationships between ideas
15. Seeks and accepts constructive criticism of his own ideas and work

Affective Processes

1. Perceives familiar objects or ideas in new ways
2. Is not satisfied with simple cognitive performances, such as mere accumulation of knowledge or memorization of data
3. Displays intellectual honesty in an intense search for truth
4. Prefers to learn in creative and independent ways rather than by authority
5. Exhibits freedom of expression in oral discussions and story telling

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[1]See J. P. Guilford and P. R. Merrifield, *The Structure of Intellect Model: Its Uses and Implications.* Los Angeles: University of Southern California, 1960. See also *Taxonomy of Educational Objectives: The Classification of Educational Goals – Handbook I: Cognitive Domain.* Edited by Benjamin S. Bloom. New York: David McKay Company, Inc., 1956.

6. Shares his own discoveries with others
7. Is open to aesthetic experiencing, awareness of beauty in the arts, and human sensitivity to others
8. Is comfortable with expressions of intuitive ideas or imaginary propositions
9. Is unashamed in spontaneous expressions of feelings derived from human understandings, whether of imaginary or real persons
10. Evidences concern for his peers, his neighbors, and distant persons
11. Displays self-confidence and assurance without selfishness or lack of consideration for peers and others
12. Sets realistic but active goals for his self-actualization
13. Accepts constructive criticism as helpful for his personal growth
14. Tolerates negative adult and peer pressures without giving up in pursuit of possibly valid solutions to problems

The preceding behavioral objectives may be synopsized for the teacher's observations, or for the children's self-observations, into a rating chart or checklist form such as that illustrated in Figure I-1. Discussions of the meanings of the objectives could parallel the study of "Creative Man," particularly if the teacher utilizes the idea of a checklist for children to evaluate their own progress. Other relevant objectives may be added to the list after discussions or individual counseling with children about their personal goals for becoming creative and productive persons.

So that children might use the checklist, it is suggested that they keep copies of the objectives in their personal notebooks. Then they can simply rate their own growth on weekly charts. Only those items that are pertinent need be marked during a particular week.

FIGURE I-1

Rating Checklist: Productive Learning

_____ Date

_____ Name

*Directions: Rate each area which applies according to the scale (1 to 5) below.**

Learning skills

Problem solving

1.
2.
3.
4.
5.
6.
7.

Attention

1.
2.
3.

Initiative and independence

1.
2.
3.

Cognitive processes

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.

Affective processes

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.

**Ratings:* (1) Needs improvement; (2) evidenced not at all; (3) evidenced once; (4) evidenced several times (2-5); (5) evidenced consistently (six or more times; or habitual attribute needing no improvement).

CHAPTER 2

The Study of Creative Man

The major concepts from the social science disciplines are all related to the study of the central theme, man. Thus, for the gifted child, concepts dealing with Creative Man may be interwoven with structural bases in the social sciences. Creative Man may be introduced deliberately in such a unit, given herein as a fourth-grade example, "Men and Women of Ideas." Even at this early intermediate level, gifted students will have been exposed to prior learning about persons who have achieved. As the students progress through the intermediate grades and beyond, they will gain increased cognitive and affective comprehension of what it means to be a creative, productive person.

While the teacher may wish to develop his own categories of outstanding achievements with his students, Figure II-1 offers a suggested means for structuring the continuing study of Creative Man. Depending on the composition and interests of the class and teachers, the sequencing of study in different segments of the outlined structure would vary from class to class.

The basic plan would be that students elect to become involved in long-term study of components of the structure given in Figure II-1. Some students might prefer to devote themselves to an indepth study of one person or category of persons; other students might select a time span to study across the breadth of several categories of creative persons or might contrast present, past, and future times. Comparisons of characteristics or syntheses could lead to multiple possibilities for activities involving productive thinking and affective awareness of creative qualities.

Guiding Questions

As guides to major concepts from the social sciences, the following questions may be interspersed throughout the study of Creative Man to encourage a broad pursuit of ideas on the topic. The teacher, or the teacher and students together, may choose those areas of focus for investigation, discovery, and discussion.

Physical Geography

1. How have differences in climate affected the lives and productivity of creative men and women?

FIGURE II-1

Categories of Outstanding and Creative Achievements

Characteristics	Artists	Authors	Explorers	Inventors	Musicians	Philosophers	Scientists	Others
Early Life								
Youth								
Adulthood								
Education								
Personality								
Uniqueness								
Historical influences (local and world)								
Environmental influences (local and world)								
Syntheses								
Commonalities								
Differences								

2. Have some creative persons been especially affected by the climate where they lived?

3. How have creative men and women adapted and modified their lives in response to problems presented by climatic conditions?

4. What other physical conditions of the land have limited or helped creative persons?

Cultural Geography

1. In what way has each creative person's environment in a particular locale contributed to his economic welfare?

2. How have social and societal patterns in each creative man's environment affected his behavior?

3. In what ways has his political environment modified the creative productivity of each creative man or woman?

4. In what parts of the world have been found economic, social, and political factors that have increased man's productivity?

5. In what areas have conditions been such that creative man has been greatly inhibited in his productions?

History

1. How would you present the sequence of development of creative men and women in each of the sciences; in the several forms of art; in literature (prose and poetry); in social leadership; in inventions; and in other areas?

2. Why have changes, creative productions, and inventions taken place more rapidly in certain periods in history?

3. What has contributed to the inhibition or delay of creative progress in other periods in history?

4. What have been some of the common characteristics of creative men and women in the different periods in history?

5. What are the implications for creative progress in our day?

6. What are your predictions for creative men and women in the future?

7. What may be the effects of a cultural heritage on various kinds of creativity?

8. What has appeared to be the role of ideals, ethics, and moral values in the development of man's creativity?

9. How would you collect, specify, analyze, and interpret data related to any of the previous questions?

Political Science

1. What has been the importance of the state or the nation in the development of a particular creative person?

2. How has a particular country's philosophy of government affected the creativity of men and women in that country?

3. What may be the particular conditions that foster "social invention"?

4. Why do certain countries appear to have more flexible and creative people leading their governments?

5. How may man someday invent an effective international, even global and interplanetary, political system based on humanistic ideals?

6. What are the conditions under which civilization produces larger measures of freedom to be creative?

7. What are some of the differences involved between a political climate in which creative persons are contributing to humanity and a political climate in which creativity develops more in terms of self-interest only?

8. Is democracy necessary for the fostering of creative productivity in citizens?

9. How do creative persons show their responsibility as citizens?

Economics

1. How have creative persons contributed to the economic welfare and economic progress of society?

2. What are the relationships between the creative arts (painting, music, and literature) and the productivity of the economy?

3. What evidence is there that some creative people are productive despite economic deprivation?

4. Does competition foster or inhibit creative thinking? Why?

5. What may be the relationship between standard of living and creativity in various countries?

Anthropology

1. What are the factors contributing to the evolution of more creative cultures?

2. How would you characterize the development of less creative cultures?

3. What is some of the earliest evidence of man's ability to adapt and adjust to his natural environment?

4. In what ways are creative men and women more inventive in adapting to their natural environment than are other men and women?

5. What would it be like if you imagined yourself to be a creative person 1,000 years ago? 500 years ago? 100 years ago?

6. How is your cultural background related to your own creativity?

7. What are the creative opportunities and the urgent problems that need resolution in our culture today?

8. What basic changes in the culture will man make in the next 100 years?

9. What are some of the problems that man must resolve to promote the welfare of mankind and mutual respect for various cultural patterns?

10. Are there variations in the creative productivity of various ethnic groups? If so, why do such differences exist?

11. What is the responsibility of society to the creative person?

Psychology

1. How does creative man behave among other men?
2. What are the special needs of creative persons?
3. How are creative men and women like or unlike other people?
4. To what extent do creative persons need social groups of other people?
5. What have been the effects of group membership on the productivity of various creative persons?
6. How mature are creative persons compared with other persons of their own chronological ages?
7. What are the personality characteristics of creative persons in comparison with those of other persons?
8. How do creative persons value socialization?

Sociology

1. Are there any special conflicts of creative persons with their social systems?
2. How do these conflicts come about?
3. How do creative persons communicate their new ideas to other persons?
4. How may a person realize more of his own possibilities to produce in creative ways?
5. What may be some of the effects of social class on creative performance?
6. What is the probable relationship of prestige to future creativity?
7. Does the creative man relate well to the established goals of a society? Why?
8. How do creative men in one culture relate to creative persons in another culture?
9. Are some societies more creative than others? Why?
10. How do such societies adapt and progress more rapidly than others?

11. What is the difference between social invention and social revolution?

Philosophy

1. How do the creative man's values and philosophies relate to his personal style of creating?
2. How do logic and emotions influence creative productivity?
3. How do creative persons judge their works?
4. Why may there be a lag between society's decision that our creative work has value and the creator's opinion that his work is outstanding?
5. Do creative persons prefer a philosophical emphasis upon ideas rather than "things"? Why?
6. What is a creative man, woman, or child?

Suggested Activities

Many kinds of activities may be fitted into the organization of study about Creative Man. In order to leave the choice of activities to the individual teacher and classroom group, only a few main ideas and suggestions are given as follows:

1. Both teacher and students should begin to understand their own classroom interactions to develop their own increased productivity. Therefore, Chapter IV contains discussions involving a variety of teacher-pupil interactions and thinking processes.
2. Audiovisual media offer close approximations of both the cognitive and affective learnings needed concerning the human qualities of Creative Man. Therefore, Chapter V lists films categorized according to Figure II-1. The several categories – artists, authors, explorers, inventors, and others – contain, primarily, films available as classroom teaching aids. Filmstrips, teaching tapes, and more recent films and kinescopes should be added by teachers and curriculum personnel. The films on the materials listed were chosen as representing backgrounds for study of the structure of ideas in Figure II-1 and of the guiding questions on Creative Man contained in this chapter.
3. Gifted students and their teachers will discover a greater wealth of understanding about Creative Man if they themselves study together ways of developing their own innovative activities related to the mainstream of the unit of study. The bases for planning further activities may be found in this author's parallel *Teaching Gifted Children Social Sciences in Grades Four Through Six.* As a consequence only a list of some activities that could be selected by a particular teacher and class are given as follows:

a. Frequently discuss different kinds of thinking with the class. Have children and teacher recognize the need for varying procedures when some kinds of productive thinking are not being used.
b. Have students write divergent thinking questions for discussions of state textbooks and other references.
c. Plan regular periods for applying definite practice in productive thinking activities.
d. Create a growing climate of openness for studying and using creative processes described by creative persons.
e. Form the habit of examining ideas for logic, imaginativeness, and constructive criticism.
f. Produce valid materials and activities that have not appeared in texts, reference books, or audiovisual materials about creative persons as if students were the person(s) or lived in the times of the person(s). Use these materials for teaching others.
g. Permit student committees to study the films on Creative Man and to plan to teach others through selecting films and activities for other students.
h. Have students create scenery and plays; write news items, poems, music, and stories; devise simulation games and "Twenty Questions" games, crossword puzzles, mysteries, treasure hunts, and the like about creative persons.
i. Role-play or enact spontaneous dramas following film showings or study from other resources.
j. Live for a day or a week as if each person in class assumed the character he has studied intensively.
k. Portray creative persons from different eras and write about or dramatize what would occur when they meet.

CHAPTER 3

Men and Women of Ideas

Several criteria were established for the series of lessons contained in this chapter dealing with men and women of ideas. The first criterion was that the lessons, although relatively brief, should utilize some of the major concepts in social science curricula. The second criterion was that more advanced or complex objectives of the cognitive and affective taxonomies of education would be challenged through the materials.[1] A third criterion was that the lessons would be written in a manner conducive to production of divergent thinking. A fourth criterion stipulated that the series should be timeless in that it could easily be interjected into relevant social science lessons at any time during the year yet should not readily become obsolete in content. The selection of the topic "Men and Women of Ideas" fits this requirement for timelessness. In addition, the series was viewed as particularly appropriate to challenge gifted pupils for the production of their own ideas, a fifth criterion. Thus, complex standards were attempted in the writing of the series, "Men and Women of Ideas."

Application of Criteria

Regarding the first criterion, structures of the social science disciplines – geography, history, sociology, social behavior, anthropology, and political science – were included. Interrelationships between basic structural ideas of the social sciences and of science are also possible in discussions of these lessons. Scientific inventions dealing with the use of energy were found in the series as represented by inventions about communications media, transportation, and electrical and atomic power. Social science concepts about space, time and chronology, change, variety, interdependence, and adaptation are portrayed.

Basic generalizations in social science sometimes parallel scientific generalizations, such as the following:

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[1]See *Taxonomy of Educational Objectives – Handbook I, op. cit.* See also David R. Krathwohl, Benjamin S. Bloom, and Bertram B. Masia, *Taxonomy of Educational Objectives: The Classification of Educational Goals – Handbook II: Affective Domain.* New York: David McKay Company, Inc., 1956.

- Individuality and dignity of each person
- Development of man's power through moral and spiritual values (concern for one's fellow man)
- Influence of a climate of freedom on the development of ideas
- Contributions to world cultures from many individuals
- Interdependence of peoples
- Cultural variations
- Other comparisons between countries
- Comparisons between eras in time
- Environmental influences on man and man's influence on his environment
- Man's attempts to make life more meaningful
- Man's use of intelligence in problem resolutions
- Changes in society through new ideas and technological advances
- Continuity and change as characteristic of man's experience

Some of the primary structural concepts to be developed throughout social sciences curricula may be successfully integrated with this series.

The persons included in the series – Benjamin Franklin, Thomas Edison, Alexander Graham Bell, Pierre and Marie Curie, Henry Ford, the Wright brothers, and Franklin and Eleanor Roosevelt – are representative of men and women who made significant contributions to society. The two women, Marie Curie and Eleanor Roosevelt, were included in order to attract girls by the idea that women also have made significant contributions. Two husband-and-wife teams, the Curies and the Roosevelts, and the team of brothers, the Wrights, were intended as examples of team combinations of ideas and efforts.

The second criterion for the series of lessons contained in this chapter required the careful study of some of the primary concepts of the social sciences. The chief sources considered were the cognitive and affective taxonomies of education previously referred to.[2] References concerning the structure of social science disciplines were provided by the Montgomery County Public Schools, Rockville, Maryland. The information contained within the lessons was obtained mostly from social science textbooks used in California public schools. In addition, an autobiography of Mrs. Eleanor Roosevelt was used.

Concerning the third criterion, a style conducive to the production of children's productive thinking, the investigator summarized

[2] *Ibid.*

principles garnered from composite theories of creativity. Creative curriculum writing, it was proposed, includes these facets:

1. Questions imbedded in the text of the lesson that are designed to stimulate divergent thinking
2. Proposals that the readers place themselves in the time or locale of the social science content or in the position of the persons in the lesson
3. Within the continuity of the lesson unit, recurring themes, comparative concepts, and potential relationships and interrelationships
4. Emphases on the development of children's own ideas, extensions of the given information, and the value of thinking for oneself
5. Presentations of lessons schedules to allow one day between lessons for "incubation periods"

Biographical Sketches

This section contains biographical sketches of men and women of ideas. In Chapter IV some of this biographical material is used in discussions.

Lesson I (A): Benjamin Franklin

One of America's early men of ideas was Benjamin Franklin. He lived during the colonial days. One of the best things he did was to get France to help us in the revolution against England. He was also an inventor, a printer, and the writer of *Poor Richard's Almanac.*

Ben learned to be a printer, working in his brother's shop when he was ten years old. When he was sixteen, he went to Philadelphia. There he easily found printing jobs. Soon he began a printing shop of his own and published a newspaper called the *Pennsylvania Gazette.* He also wrote a new kind of almanac, full of humor and clever sayings in addition to information on weather, crops, and other things. Some of the sayings from *Poor Richard's Almanac* are still heard today, such as the following: "If a thing is worth doing it is worth doing well."

Franklin gave us many "firsts." He thought others would like to read as he did and opened the first public library in America. He started the first police department and the first fire department. He even acted as a fireman himself. Ben liked to talk with others about ways of doing things better and met weekly with other men of ideas. This group became the American Philosophical Society, which encouraged science and scientific thinking. Ben started a school that became the University of Pennsylvania. As first postmaster he had mail delivered to people's houses.

As an inventor Ben, having found that lightning has electricity, invented the lightning rod to protect houses from lightning. Iron Franklin stoves are used today in heating some houses. Another of his inventions was bifocal glasses, which helped people see both far and near. Ben experimented with conductors of heat and with evaporation of liquids. He noticed that white clothes are cooler than dark clothes. He found that wind caused liquids to evaporate more quickly. He wrapped a cloth soaked in ether around a bulb of a thermometer. When he whirled the thermometer, the ether cloth caused the thermometer to have a lower temperature than did a cloth soaked in alcohol.

Some of Franklin's ideas led to inventions that we use today. How do we use ideas from his experiments? Can you thing of ways that we have improved upon Ben Franklin's early scientific knowledge?

When Ben was seventy years old, he was on a committee that wrote the Declaration of Independence. Franklin did not agree with everything that the main writer, Thomas Jefferson, said. Although Ben made a few changes, he felt the Declaration was good. After our country had gained freedom from England, when Ben was eighty-one, he helped write the Constitution of the United States. Again, he disagreed with some ideas but helped other men get together when they argued about what to write. Franklin's quick wit and clever sayings made the men laugh and relax so that they could work together again.

His clever words won the help of France during the Revolutionary War. When he first went to France for aid, the French would not agree to fight against England with the Americans. Later, through his charm and witty sayings, Frankling enlisted French help. People all over France liked Franklin and repeated his sayings. Ben Franklin could be called our first American diplomat.

Benjamin Franklin – scientist, inventor, writer, statesman, and diplomat – was a man whose ideas meant much to our country and to other people. As a scientist, he believed that ideas should be tested. If better ideas came along, the old ideas should be changed. How has our thinking changed since Franklin's day? What inventions and improvements by others came from Franklin's ideas?

Lesson I (B): Thomas Alva Edison

How could one man produce more than a thousand inventions? Thomas A. Edison did. As a young man he worked long hours on his inventions because he believed that he would not have time to perfect all of them. He lived to be more than eighty years old.

Perhaps Edison is most remembered for the electric light. We may not think much about having electric lights today, but imagine what

it must have been to live when people did not have such lights in their homes. How would you live without electric lights?

Edison is known for other inventions we use every day. The typewriter, telegraph, motion picture machine, and telephone were inventions he improved. He invented the "talking machine," or phonograph. People laughed when he said the machine would talk. They couldn't tell whether the voice was that of a screechy parrot or a human being when they first heard "Mary had a little lamb" on the machine. How would we get along today if we didn't have some of these inventions?

Al did not attend school very long; he was thought to be dull. His mother, a teacher, taught him. Al taught himself much also, for he was always reading. He read all he could find about chemistry and electricity. While he was a newsboy on a train, he did chemistry experiments and published a weekly newspaper in the baggage car. He was only twelve years old, but his customers on the train liked his newspaper, which contained news and jokes. The customers bought all of his copies.

Young Edison was always experimenting. His experiments in the baggage car ended when a chemical exploded and the car caught on fire. The conductor threw Al and his equipment off the train at the next stop.

Al saved the stationmaster's small son from the path of a train when the boy was playing on the tracks. The stationmaster, who was very grateful, taught Al to be a telegraph operator. Soon he was so speedy that he could get other telegraph jobs. He didn't always pay attention to his work when he was thinking of his experiments. Though he lost several jobs, he was so fast that he could get new jobs.

A few years later in New York, Al entered a large office. An important machine had just broken down. Al was the only one who could fix it. The man in charge was so happy that he gave Edison a position in which he could earn $300 a month. This was quite a bit of money in those days.

In his spare time Edison worked on experiments and inventions. He improved machines in the office where he worked. The president of the company offered to pay for one of his inventions. Edison was surprised that the offer was $40,000. He had been afraid to ask for $3,000 to $5,000. It would be hard to guess how much this invention and Edison's other inventions would be worth today. The importance of his inventions to our country and to the world would be even harder to guess. Can you think how he has helped us to attain a higher standard of living?

Money he received for inventions made it possible for him to have his own shop and to hire assistants. Even with assistants, however, he never had enough time. He taught himself to do with little sleep, for he was too busy following ideas for inventions. Many times ideas did not work at first, but he kept on trying to change the ideas until they did work.

Edison could think quickly but still had little time. He saved the life of a sick girl who needed to be cool. He hurried to make the little girl's room cooler by having a fan blow over ice. Perhaps this was the first air conditioner.

In 1928 Edison was given one of the country's highest honors, the Congressional Gold Medal, by President Calvin Coolidge. The following year people in the United States celebrated the fiftieth anniversary of the electric light. A science scholarship was begun in his name. How do *you* think Edison's ideas live on?

Lesson II: Alexander Graham Bell

"Mr. Watson, come here. I want you." Alexander Bell didn't know that this time his voice would be understood by John Watson. They had worked 40 weeks trying to improve the telephone so that they could understand voices over a wire. The wire ran from a workbench to Bell's room two stories above. Before that day they had been able to hear sounds, but not words, over the wire. When Mr. Bell accidentally spilled a liquid, he called for Mr. Watson. Watson understood Bell's voice for the first time over the telephone.

Aleck Bell had always been interested in sound. He began to study sound in Scotland as a speech teacher for the deaf. His father and grandfather had been speech teachers too. Aleck came to North America when his doctor suggested a change of climate. His health improved in Canada. Soon he moved to Boston, Massachusetts. There the father of one of his pupils gave him the use of a basement where he could work on his experiments. Bell had always dreamed of inventing a way of talking over wire.

People who first saw the telephone at the Centennial Exposition in 1876 thought it was a toy. Judges, tired after looking at many exhibits, almost passed Mr. Bell without noticing the telephone. The emperor of Brazil came over to listen. He jumped when he heard Bell's voice on the telephone, and cried out, "My word! It talks!" The judges then tried the telephone. They agreed that it was a wonderful invention.

Later, Bell, Watson, and others improved the telephone so that people could talk over longer distances. Friends helped him start the Bell Telephone Company. One friend insisted that he patent the

telephone. He did, just before another inventor, Elisha Gray, tried to patent a similar idea.

Sometimes two people arrive at the same idea at about the same time. Both Bell and Elisha Gray must have felt the need for people to be able to talk together from a distance. How would you have felt if you had been Elisha Gray?

Alexander Graham Bell won honors and wealth from his invention. Millions of telephones were put in use throughout the world. He lived to speak coast to coast on the telephone but did not live to see the opening of telephone service across the ocean. Aleck Bell began by helping deaf people learn to speak to others. With the invention of the telephone, we can now speak to others miles away. Why do you think the telephone has often been called one of America's greatest gifts to the world? Can you imagine how we would live today without the telephone?

Lesson III: Marie and Pierre Curie

Among the teams of scientific inventors were Marie and Pierre Curie. They worked together to find the radioactive substance called radium. Although they were always struggling to find enough money for living and for research, they were very happy. As husband and wife they helped each other to think of better ideas.

For example, when they found that radium burned the skin on Marie's hands, they talked with each other and with other physicists. They thought radium might cure diseased skin. Now modern doctors use radium to cure cancer. The Curies observed that radium seemed to be continually exploding, giving off great energy. They wondered then how this energy might be used.

Marie was born in Poland when that country was under the control of Russia. Her father was a professor of physics and her mother the principal of a school. Marie, or *Manya,* had to recite in Russian the names of the Czars when a Russian inspector came to her school. Although she trembled, she spoke well. When the inspector left, she and her classmates studied again in their hidden Polish books. Her father was not so lucky. His students did poorly for the Russian inspector, so he was never promoted to positions with higher pay.

After Marie graduated from high school with honors, she could not go on to the university. Her family was too poor, and the university in Poland would not admit women students. Marie worked as a governess to support her sister Bronya's study in France to be a medical doctor. When Bronya no longer needed help, Marie also went to study in Paris. There she met her future husband, Pierre Curie. She was just beginning to do research.

Pierre was already doing his own research. He had decided never to marry, until he met Marie. He enjoyed being with Marie and helped her with her research. He found that she helped him to think. After they were married, she inspired him to do a brilliant study for his doctoral degree.

From then on they worked together, sometimes on Pierre's ideas, sometimes on Marie's. Their research together was often continued until two or three o'clock in the morning in the cold shed that was Marie's laboratory. Marie too won her doctoral degree, doing research on the radioactive material known as radium. Marie's study of radium continued. Pierre thought the study so important that he took time from his own work.

As they found out more about radium, promotions and honors made their life a little easier. They lived simply but more comfortably. Sometimes friends – well-known authors, artists, and other physicists – visited them. But honors were a nuisance too. Marie usually wore one special black dress for official occasions. She began to feel out of place among the other stylish ladies. But Pierre complimented Marie on her gown. He wondered how much research could be done with the money in jewels the stylish women wore. After the Curies won a Nobel prize, they were invited to many affairs. This took time away from their important research, so they went to only some of the official parties.

Pierre was killed suddenly in an accident, bringing to a close their wonderful life together. Marie continued the work, with research assistants, including her daughter Irene, helping her. Later, Marie again won a Nobel prize. She was the only person to win the prize twice. She wrote much about radioactivity, spoke in many countries, and helped her students with their research. Madame Marie Curie died when she was over sixty. She had been ill from being too near her precious radium for so long.

The Curies might be surprised today to know all of the different ways atomic energy has been used. What are some of these ways? What are some other possible uses? How has our world changed since atomic energy?

Lesson IV (A): Henry Ford

"Get a horse!" People laughed and dogs barked as Henry Ford chugged down the street in his early horseless carriage. Charles Duryea and Henry Ford were both working on about the same idea in the early 1890s. Duryea finished his car in 1892; Ford completed his in 1893.

But the first cars were very expensive. Only rich people could afford them. Henry Ford wanted more people to have cars, so he

tried to make cars at a lower cost. He bought mines, forests, and rubber plantations so that his materials would cost less. He trained workers to do their jobs better. Each worker did only one job as the parts came to him on a moving belt. Ford improved conditions in his factory, taught men from other countries to read and write English, had a health service at the factory, and helped his men find the jobs where they worked best. Workmen produced more cars in less time. Over a million people owned a *Model T* Ford by 1914. Ford helped people buy cars at a reasonable price and helped his workers too.

How has the automobile changed life in America? As more people drive more cars, how do other businesses change? What would we do if there were no automobiles today?

Lesson IV (B): Wilbur and Orville Wright

The Wright brothers dreamed that men could fly. They worked as a team to put a motor on a glider so that it flew with its own power. The first flight, twelve seconds long, took place at Kitty Hawk, North Carolina, in December, 1903. Each brother took turns until on the fourth flight Wilbur flew the plane for 59 seconds, a distance of 852 feet. How excited they were!

Those of you who have flown for longer times and distances may make fun of such short flights. But would you have been able to fly if these early flights by the Wright brothers had not been made? How has flying changed since those first flights? How has the airplane made our lives different? How may the airplane change our lives even more?

Lesson IV (C): Franklin and Eleanor Roosevelt

Franklin and Eleanor Roosevelt were another husband-wife team helping each other with ideas. Franklin, or "FDR" as he was called, was President of the United States during World War II. He permitted the construction of the first atomic bomb in the hope that the fighting would stop soon when people saw such a horrible weapon. He is remembered for radio "fireside chats" when he told people more about the war and problems of the government. Before the war, during the 1930s, he had started programs to find jobs for more people and to make the country prosperous. After he was crippled by polio, he wanted to help others who had the disease. He started the "March of Dimes" to fight polio.

Eleanor discussed ideas with Franklin but spent most of her time with the family. Later, when Franklin traveled in the United States or other countries, she went with him. People listened also to her ideas as they talked. She learned much wherever they went. After Franklin died suddenly, just before the end of World War II, Mrs.

Roosevelt continued with some of their ideas to help people. She went to many countries where she listened to and spoke with the people. Eleanor was especially interested in making health and education better around the world. She worked with the United Nations to see what could be done to help refugees, the sick, and poor people everywhere. She was glad to see the beginning of the "Peace Corps," for she had had a similar idea for some time. Both Franklin and Eleanor spent their lives trying to improve the lives of others.

Lesson IV (D): A World of Change

Rapid changes are taking place in our scientific age. Many problems arise from our new scientific knowledge. Perhaps we should think of some of these questions:

- What will automation mean to men trying to find jobs?
- How can different countries learn to live in peace in this time of the atom?
- How do new means of transportation and communication concern our lives?
- What might happen if we keep improving our scientific knowledge?
- What might happen if we try to improve health and education around the world?

These are concerns all people of ideas had for their world.

CHAPTER 4

Pilot Study

A pilot study on the topic "Men and Women of Ideas" was made in 35 intermediate grade classrooms in southern California to find out what thinking processes would evolve in discussions following the lessons. In the study all of the students involved listened to identical tape recordings of the lessons while following the script of the lessons in mimeographed form.

The tapescripts of some of the discussions are given in the next section. The thought processes involved appear in coded form (in parentheses) after each portion of dialogue. The code itself is explained as follows:

Code	*Explanation*
R	Routine: management, structuring, praise or reproach, agreement or disagreement
Q:R	A question about R
C-M	Cognitive-memory: recitation, quoting, factual statements, or restatements of previous content
Q:C-M	A question about or asking for C-M
CT	Convergent thinking: explanation, generalization, summary conclusion, or logical deduction
Q:CT	A question about or asking for CT
ET	Evaluative thinking: a rating, judgment, opinion, or counter-judgment
Q:ET	A question about or asking for ET
DT	Divergent thinking (creative thinking): elaborations, implications, divergent associations, or spontaneous synthesis of new ideas

Note: Bracketed coding, such as [C-M(CT&ET)], indicates that the actual thought process was the first indicated, even though it is a repetition of a prior idea. In the example just given, the speaker repeated information regarding a prior statement of CT&ET.

Teacher I

Teacher: All right, now, let's go to the husband and wife team that we've talked about and heard about. (R)

Child: Franklin Delano Roosevelt was President during World War II. (C-M)

Child: FDR had polio, and he couldn't go to all the places he had to make speeches, so Eleanor would go for him. And when she first started to make these speeches she had a squeaky voice; so she had to go take lessons so she could have a more mature voice. (C-M)

Child: After Franklin Roosevelt was crippled with polio, he wanted to help others who had had the disease; so he started the March of Dimes. (C-M)

Teacher: The March of Dimes is still being carried out today, and it's doing a great service. (C-M & ET)

Child: After FDR suddenly died, Eleanor started to see what could be done for refugees, sick people, and – (C-M)

Child: Franklin and Eleanor Roosevelt wanted to help people. Eleanor was glad to see the Peace Corps. [C-M (CT & ET)]

Child: Eleanor discussed the ideas with Franklin, but she spent most of the time with the family. (C-M)

Child: Before the war, in the 1930s, FDR started a program to find more jobs for people and to make the country more prosperous. (C-M)

Child: Both Franklin and Eleanor spent their lives trying to improve the lives of others. [C-M (CT)]

Teacher: I wonder if we could say that this could be true of all of these great people we studied in this series of recordings. Did all of these great people help to improve the lives of others? (CT & Q: ET)

Child: Yes. (ET)

Teacher: Can we go over some reasons why it would be true? (Q: CT)

Child: Henry Ford made the automobile. (C-M)

Teacher: Did it make life easier for us, too? (Q: ET)

Child: Wilbur and Orville Wright changed our lives by designing the first airplane. (CT)

Child: And Franklin and Eleanor Roosevelt helped people that were crippled and didn't have hardly any money. (C-M)

Child: Mr. Bell invented the telephone. (C-M)

Child: FDR started the March of Dimes. (C-M)

Child: Pierre and Marie helped to fight cancer and found other ways of curing it. (C-M)

Child: Franklin was remembered for his "fireside chats" to give people an idea what was happening in the government about World War II. (C-M)

Teacher: And this was very important at that time. (ET)

Note: No divergent questions were used in the discussion just concluded; the majority of the teacher's comments dealt with evaluative thinking. Children responded with an overhwelming majority of cognition-memory answers. The discussion was maintained under the teacher's control and at a superficial level.

Teacher II

Teacher:	Boys and girls, there are several boys in universities today throughout the country who have shown brilliance in science and in inventions. Does this give you an idea that we are becoming patient and more interested in scientific discoveries? (ET & Q: ET)
Class:	Yes (numerous answers). (R)
Teacher:	If you boys and girls showed promise in this field, do you think that you should be encouraged in school to go ahead and work beyond what you are doing in the classroom in our schools today? Richard? (Q: ET)
Richard:	I don't know. (C-M)
Teacher:	Rick. (R)
Richard:	I think they would. (ET)
Teacher:	You think so? (Q: ET)
Richard:	Probably not in elementary, but getting into junior high and high they would. (ET)
Teacher:	In other words, with all the patience and tolerance we would have today, they would probably be able to invent many more things and do it faster. Let us talk about two persons who didn't invent anything but did contribute a great deal to mankind – Franklin and Eleanor Roosevelt. Do you consider that these people, although they did not invent an airplane or make a scientific discovery, were people of ideas? Mike? (CT, R, & Q: ET)
Mike:	No. (ET)
Teacher:	You don't think that they were? (C-M)
Mike:	No, because all that they did they were just trying to help the people. (CT)
Teacher:	Are there other ways, Mike, of contributing to the good of mankind than making scientific discoveries or inventing something? (Q: ET)
Mike:	Yeah. (R)
Teacher:	How do you think Franklin Roosevelt did this as one of our Presidents? (Q: ET)
Mike:	Well, he was trying to prevent polio and other things. (CT)
Teacher:	How did he try to prevent polio, Suzie? (Q: CT)
Suzie:	He started the March of Dimes. (C-M)
Teacher:	And what was the March of Dimes. Do you know? (Q: C-M)
Suzie:	Well, you contribute to it and they would send it to some place that would cure people with polio. (C-M)
Teacher:	Was it used, do you believe, to do more research on polio so that scientists could discover a vaccine to prevent polio? Do you think that the March of Dimes was contributing to mankind, Kathy? (Q: C-M & Q: ET)

Kathy: Yes, I think it was. (ET)
Teacher: Do we still have the March of Dimes today? Kevin, do you know? (Q: C-M)
Kevin: Yes. (C-M)
Teacher: Is it used mostly for scientific study of polio or are we now using it for something else? Steve, do you know? (Q: C-M & Q: R)
Steve: No. (R)
Teacher: Does anybody know what the money being raised by the March of Dimes is being used for? (Q: C-M)

Note: In the discussion just concluded, the teacher played "ping-pong" verbally with the students: teachers's response – child's response; teacher's response – child's response, and so on. Again, divergent cues were not used by the teacher, who concentrated her efforts primarily in evaluative, convergent, and cognitive-memory kinds of thinking. Students' responses showed thinking parallel to the teacher's thoughts. Their "routine" responding provided an index of perfunctory or even negative compliance to the teacher's approach.

Teacher III

Teacher: How may airplanes change our lives even more? Think to the future. (Q: DT & R)
Child: The airplane will help us win the war. (DT & CT)
Child: Like in the car there's too much traffic, and in an airplane you just go all the way down and crash; and cars aren't that dangerous. (DT)
Child: The airplane gave us the idea to make rockets. (DT)
Child: It takes longer to get somewhere. (DT)
Child: If we didn't have planes, during the war they couldn't use the bombs to blow up things. (DT & ET)
Child: The idea of the airplane helped make the helicopter. (DT)
Child: They've helped the police force, and they're used for just flying around. (DT)
Child: If somebody escaped or something, and we were in the desert, we could only look out, but if we were in an airplane we could look down. (DT)
Child: When guys escape from prison, they send a helicopter out and find the car; then they drop some powder on the windows so they can't see. (C-M)
Teacher: Let's go on to the next subject. Who was Franklin Roosevelt? (R & Q: C-M)
Child: He was President during World War II. (C-M)
Child: And his wife and him – they were another husband and wife team. (C-M)
Child: They called him "FDR" for short. (C-M)

Child: He first started the March of Dimes. (C-M)
Child: Franklin wasn't the first President whose last name was Roosevelt. (C-M)
Child: He had polio, and he wanted to help people; so he started the Peace Corps and the March of Dimes. (C-M & CT)
Child: He was President during World War II. (C-M)
Child: He started programs to find jobs for more people. (C-M)
Child: He started the March of Dimes to help fight polio. (C-M)
Child: He was crippled by polio. (C-M)
Child: Eleanor Roosevelt worked in the United Nations to help people that were sick and poor. (C-M)
Child: During the 1930s he started problems. (C-M)

Note: At first in the discussion just concluded, the teacher used the divergent question from the text materials, and the children responded with a quantity of creative ideas. Then the teacher changed to a cognition-memory question, "Who was Franklin Roosevelt?" The children reacted accordingly, "giving back" only what was required – a list of factual statements.

In the following discussions teachers capitalize on the divergent questions from the text.

Teacher IV

Teacher: All right, what might happen if we tried to improve health and education around the world? Bill? (Q: DT)
Bill: Well, people wouldn't turn to Communism to help. (DT)
Teacher: They would, or they wouldn't? (Q: C-M)
Bill: They wouldn't. They wouldn't turn to Fascism because when people usually do that they don't have very much, and the Fascists promise things to the rebels, and they join them and begin fighting; but if they had help, then they wouldn't want any Fascism. (C-M, DT, & CT)
Teacher: O.K., Bill. Brad. (R)
Brad: Another thing. If health was improved all over the world – if they didn't have health and education – two-thirds of the population of the earth would go to bed hungry and without education. (C-M, DT, & CT)
Teacher: Gary. (R)
Gary: Well, with better health the population would overflow because everybody would be healthy, and they would live to a ripe old age; and a lot more people would live, and there just wouldn't be the room or the food for them. (DT & CT)

Note: Although in the discussion just concluded the teacher controlled the routine of response, the children's answers reflected a predominance of divergent thinking. The teacher guided, clarified, and permitted a variety of responses.

Teacher V

Teacher: What might happen if we tried to improve health and education around the world? (Q: DT)

Child: People might be more friendly; they'd want to learn. (DT)

Child: People might be able to help themselves. (DT)

Teacher: Good. (R)

Child: There might be world peace. (DT)

Child: The people might be happier, too. (DT)

Child: If we could get one language, the whole world would really be great. (DT & ET)

Teacher: What does this bring up, then, if everyone spoke the same language? (Q: DT)

Teacher: We would be neighbors. (DT)

Teacher: Good. We would sort of be neighbors. (R)

Child: We could communicate easier because we know their language. (DT)

Child: If other people in other countries wanted an education, and we gave it to them, they probably wouldn't want to have a war. (DT)

Teacher: You mean there'd be more sense. (DT)

Child: People might know what they're fighting for. (DT)

Note: In the discussion just concluded the teacher extended the profitable leads from the children's discussion. All the children's responses resulted in divergent thinking.

Teacher VI

Teacher: How do you think that new means of transportation and communication will concern our lives? (Q: DT)

Pat: Well, like our transportation to the moon, there might be chemicals up there that might help people that are crippled to be well again so they can walk. (R & DT)

Marcus: Well, we have boats and planes and everything that help transport people and supplies to other countries. (DT)

Vicki: Well, we save time because if we had horses instead of cars, they don't go as fast as a car would, and it would take a couple of days if you have to get somewhere fast in an emergency or something. (DT & ET)

Sally: I think it would help our country too because, like Vicki said, if they didn't make the cars we wouldn't be able to go visit our friends, or if you needed an emergency or anything like that, it would take a lot more time than if you had a jet or plane or a car; it would be quicker and easier to get to these planes. (ET & DT)

Note: In the discussion just concluded, one divergent question led to complex productive thoughts, perhaps predictive of future innovations. (These recorded discussions took place in 1966, well before man's landings on the moon.)

Teacher VII

Teacher: What are some of the ways the automobile has changed life in our American communities? (Q: DT)

Child: If we didn't have the automobiles, we couldn't go many places; and there wouldn't be many places because they wouldn't build because of no way to get there. (DT & CT)

Child: Everybody would have to use horses, and horses cost a lot to feed. (DT & ET)

Child: We get where we want to go faster. (DT)

Child: We wouldn't have tractors to put pavement on the ground or even to build houses. (DT)

Teacher: Right. They didn't have roads in those days, so it has changed the appearance of our times. (R, C-M, & CT)

Child: If someone was sick or something, like in some of these little towns that only have one doctor, the doctor could get to them faster. And we have ambulances now, and people would get where they want to save other people's lives. (DT & CT)

Teacher: That's a very good point. (R)

Child: Well, to get a fire engine to a fire, they'd have to use those old time fire engines. They can't get there too fast. (ET)

Child: Something about how cars influence your life. If you're playing in the street, or something, and the cars come by, well, you hardly get to play at all anymore. (R & DT)

Teacher: Yes. So, they've changed our communities in some adverse ways also, haven't they? (CT & Q: R)

Child: If you're going some place that is an hour away today, by horse it would probably take you all day. (DT)

Teacher: I liked especially the ideas about our community services. Certainly, this has helped improve our health, hasn't it? (CT & R)

Note: In the discussion just concluded, the teacher several times used positive reinforcement of divergent ideas.

Teacher VIII

David: On the question, "How did the automobile change life in America?" Well, like Arthur said, we have the dragster, and we have a lot of different kinds of cars that go a lot faster and get people there a lot faster. [R(Q: DT) & C-M]

Craig: Well, comparing the telephone with the car: If the telephone is good at communicating stuff, what would be the use if you have to walk there? So, I think the car is just as good as the telephone. (DT & ET)

James: When Henry Ford tried to lower the price of cars, he lowered the price of motors, too. (CT)

Wendy: Well, he bought mines and rubber plantations so the materials would cost less, and he paid workers to do their jobs better. (C-M)

David: Henry Ford wanted to have more cars, so he lowered the price of the cars so more people could have them because only rich people could have them. (C-M)

James: I think it is possible to imagine that without any automobiles today companies would go broke because workers would take so long to get there. (DT)

Craig: Well, I think – (ET)

James: Well, I took the question, "If the Wright Brothers had not invented the plane, would we be able to fly today?" Well, I really think we could have because someone else could have invented it. [R(Q: ET) ET]

David: You can fly. If you climb up a tree and jump down, you're flying. (CT)

James: Well, the Wrights thought of it because they saw balloons going up, probably. (CT & ET)

Eric: Well, there were a lot of people before the Wrights who thought of it. They just hadn't gotten the right idea. The question on the last part of the last page, "What might happen if we keep improving scientific knowledge?" If we do, pretty soon we might be living on the bottom of the ocean and all those things. [CM, ET, R(Q: DT) DT]

James: Well, the next thing you know we're going to be living in a different solar system altogether. (DT)

Note: In the discussion just concluded, the children used the text questions as guides to their own discussions. A variety of productive thoughts thus emerged. Implicit in this approach is the question of what would happen if divergent cues were included in many curricular materials.

CHAPTER 5

Film Materials

The films listed in this chapter are but a partial representation of classroom teaching materials about creative persons. The listing should be supplemented by reference to similar categories in catalogues of films, teaching tapes, and filmstrips. Current issues dealing with a variety of innovators and leaders from all cultures should be included in such listings. Even films related to science fiction epics may be integrated into teaching that involves the past, present, and future.

It is expected that most teachers frequently ask their students to use references from written sources: books, periodicals, historical documents, original records, and the like. Such references are left to the teacher and students, to be coordinated with the apparent realism available from films and from additional audiovisual materials. One particular series of tape recordings – the *Imagi/Craft Productions* of Torrance and Cunningham (1967) – should be considered especially relevant for creative persons.[1]

The last group of films listed in this chapter may be useful to teachers for inservice training. In these films concepts about creative teaching and creativity and about social science methods are discussed.

The complete list of films is preceded by an explanation of the coding system used. Each film in the list (except films in the last group) is followed by a code (in parentheses) that identifies the producer, sponsor, or distributor of the film. The code is that used in *The Index to 16mm Educational Films.*[2]

Key to Identification Code

ALM – Almanac Films, Inc.; ATAT – American Telephone and Telegraph Co.; BBCTV – British Broadcasting Company – Television; BAILEY – Bailey Films, Inc.; BF – Brandon Films, Inc.; CORF – Coronet Films; CAROUF – Carousel Films, Inc.; CASTLE – Castle Films; CF – Churchill Films; CMC – Columbia University; CONSFI – Consolidated Film Industries; CON – Contemporary

[1] E. Paul Torrance and B. F. Cunningham, *Imagi/Craft Productions: Programmed Experiences in Creative Thinking.* Boston: Ginn & Company, 1967.

[2] Produced by the National Information Center for Educational Media, University of Southern California. New York: McGraw-Hill Book Company, 1967.

Films; DISNEY – Disney (Walt) Productions; EBF – Encyclopedia Britannica Films; HARRIS – Edward Harrison Pictures; FA – Film Associates of California; FLEET – Fleetwood Films, Inc.; FMCMP – Ford Motor Co.; FRCAMR – Franco-American Audio Visual Center; GJP – Grover-Jennings Productions; HRAW – Holt, Rinehart and Winston; IFB – International Film Bureau; IFF – International Film Foundation; IDEAL – Ideal Pictures, Inc.; JACOBS – Lewis Jacobs; MGHT – McGraw Hill Textfilms; MLA – Modern Learning Aids; NF – Norwood Films; NFBC – National Film Board of Canada; OFF – Official Films, Inc.; PATHE – Pathe News; PIC – Pictura Films Corp.; RADIM – Radim Films, Inc.; SAUDEK – Robert Saudek Associates, Inc.; SMI – Simmel-Meservey, Inc.; STAR – Star Film Co.; TFC – Teaching Film Custodians; UWISC – University of Wisconsin, Bureau of Audio Visual Instruction; USC – University of Southern California; USDS – U. S. Department of State; UWF – United World Films, Inc.; VADE – Virginia Department of Education.

List of Films

The films listed in this chapter are divided into various categories for the convenience of the instructor. Each category is identified by an appropriate heading.

Subject	*Title*
Artists (Specific)	
Audubon	*Audubon and the Birds of America* (CORF)
	John James Audubon (EBF)
Degas	*Degas, Master of Motion* (USC)
Da Vinci	*Drawings of Leonardo Da Vinci* (BF)
	Leonardo Da Vinci, Giant of the Renaissance (EBF)
	Leonardo Da Vinci and His Art (CORF)
Goya	*Goya – The Disasters of War* (RADIM)
Grandma Moses	*Grandma Moses* (RADIM)
Gross	*A Sculptor Speaks* (Chaim Gross) (JACOBS)
Matisse	*Henry Matisse* (FRCAMR)
Michaelangelo	*The Titan: Story of Michaelangelo* (CON)
Moore	*Face to Face* (BBCTV)
Picasso	*Visit to Picasso* (FLEET)
Rembrandt	*Rembrandt: Painter of Man* (CORF)
	Rembrandt: Poet of Light (IFB)
	Rembrandt Van Rijn: A Self-Portrait (EBF)
Ryder	*The Paintings of Albert Ryder* (EBF)
Van Gogh	*Vincent Van Gogh* (CORF)
Wyck	*Klee Wyck: The Story of Emily Carr (NFBC)*
Artists (General)	
	American Primitives (EBF)
	Art and Motion (EBF)
	Artists and Nature (BAILEY)

Gaudi	*Antonio Gaudi* (Architecture) (CMC)
Jefferson	*Jefferson the Architect* (Architecture) (IFB)
	Works of Winslow Homer and John Martin (EBF)
	Works of John Trumbull and Edwin Forbes; Lithographs of Currier and Ives and Thomas Eakins (EBF)
	The Mime (Dramatic artist – Tony Montanaro. Consider recent television programs and films for other resources about dramatic artists.) (CMC)
	Uncommon Clay (IFB)
Wright	*Frank Lloyd Wright* (architecture) (EBF)

Ideas in Art

	Art and Motion (EBF)
	Art and You (FA)
	Artists and Nature (BAILEY)
	Arts of Japan (NF)
	Painting Pictures about People (IFB)
	Picture Making by Teenagers (IFB)
	Sculpture (ALM)

Writers

Alcott	*Louisa May Alcott* (EBF)
Buck	*Pearl S. Buck* (EBF)
Cooper	*James Fenimore Cooper* (EBF)
Dickens	*Charles Dickens: Background for His Works* (CORF)
Frost	*Robert Frost* (EBF)
Holmes	*Oliver Wendell Holmes* (EBF)
Irving	*Washington Irving* (EBF)
Longfellow	*Henry Wadsworth Longfellow* (EBF)
Poe	*Edgar Allen Poe: Background for His Works* (CORF)
Sandberg	*Carl Sandberg* (EBF)
	Carl Sandberg Discusses His Work (CORF)
Shakespeare	*William Shakespeare* (EBF)
Twain	*Mark Twain and Tom Sawyer* (IFB)
	Mark Twain: Background for His Works (CORF)
	Mark Twain Gives an Interview (CORF)
Whitman	*Walt Whitman: Background for His Works* (CORF)

Writing

	Poems are Fun (CORF)
	Poems We Write (GJP)
	Poetry to Grow On (GJP)

Explorers and Pioneers (Specific)

Boone	*Daniel Boone* (EBF)
Byrd	*Byrd at the Poles* (PATHE)

Columbus	*Path of Columbus* (SMI)
	Story of Christopher Columbus (EBF)
Drake	*Sir Francis Drake's Life and Voyages* (CORF)
Fremont	*John Charles Fremont* (EBF)
Lafayette	*Lafayette – Soldier of Liberty* (EBF)
Polo	*Marco Polo's Travels* (EBF)
Shepherd	*United States Space Pioneer* (Alan B. Shepherd) (CORF)
Smith	*Captain John Smith, Founder of Virginia* (EBF)

Explorers (General)

First Men into Space (EBF)
French Explorations in the New World (CORF)
French Explorers (EBF)
Space Flight Around the Earth (CF)
Spanish Explorers (EBF)
Understanding Our Universe (CORF)
The Vikings and Their Explorations (CORF)
The Van Allen Radiation Belts: Exploring in Space (EBF)

Inventors (Specific)

Bell	*Mr. Bell* (ATAT)
Da Vinci	*Leonardo Da Vinci: His Inventions* (PIC)
Edison	*Thomas Alva Edison* (PATHE)
	Thomas Alva Edison: Let There Be Light (STAR)
Whitney	*Eli Whitney* (EBF)
Wright Brothers	*First Flight of the Wright Brothers* (from the "You Are There" series) (MGHT)

Inventors (General)

The American Road (FMCMP)
Discovery of Radioactivity (IFF)
Fortune Seekers (PATHE)
Inventions in America's Growth (1750-1850) (CORF)
Inventions in America's Growth (1850-1910) (CORF)
Mirror in the Sky (MGHT)

Leaders (Specific)

Alexander	*The Triumph of Alexander the Great* (from the "You Are There" series) (MGHT)
Anthony	*Susan B. Anthony* (EBF)
Ben-Gurion	*David Ben-Gurion* (EBF)
Bolivar	*Bolivar: South American Liberator* (CORF)

Calhoun	*John C. Calhoun* (EBF)
Charlemagne	*Charlemagne and His Empire* (CORF)
Churchill	*Winston Churchill* (PATHE)
Franklin	*Benjamin Franklin* (EBF)
Gandhi	*Gandhi* (MGHT)
Hamilton	*Alexander Hamilton* (EBF)
Hoover	*Herbert Hoover (I, II)* (EBF)
Hutchinson	*Anne Hutchinson (I, II)* (EBF)
Jackson	*Andrew Jackson* (EBF)
Jefferson	*Thomas Jefferson* (EBF)
	Jefferson of Monticello (VADE)
Kennedy	*John Fitzgerald Kennedy – Man and President* (UWF)
Lee	*Lee the Virginian* (MGHT)
	Robert E. Lee: A Background Study (CORF)
Lincoln	*Abe Lincoln: The Boy and His Stepmother* (CAROUF)
	Abraham Lincoln (EBF)
	Abraham Lincoln: A Background Study (CORF)
	Boyhood of Abraham Lincoln (CORF)
	Face of Lincoln (USC)
	Lincoln in the White House (TFC)
	Meet Mr. Lincoln (EBF)
Lindsey	*Judge Ben B. Lindsey (I, II)* (SAUDEK)
Marshall	*John Marshall* (SAUDEK)
Mason	*George Mason (I, II)* (SAUDEK)
	George Mason of Gunston Hall (VADE)
Mussolini	*Mussolini* (MGHT)
Napoleon	*Napoleon's Return from Elba* (from the "You Are There" series) (MGHT)
Nehru	*Jawaharlal Nehru* (EBF)
Roosevelt, F.D.	*FDR: Third Term to Pearl Harbor* (MGHT)
	Franklin Delano Roosevelt (OFF)
	Franklin Delano Roosevelt: "FDR" (STAR)
Roosevelt, T.	*Teddy, the Rough Rider* (TFC)
	Theodore Roosevelt (PATHE)
	Theodore Roosevelt, American (NF)
	Times of Teddy Roosevelt (MGHT)
Washington, B. T.	*Booker T. Washington* (EBF)
Washington, G.	*Boyhood of George Washington* (CORF)
	George Washington (EBF)
	Washington Crosses the Delaware (from the "You Are There" series) (MGHT)
	Washington's Farewell to His Officers (from the "You Are There" series) (MGHT)
Webster	*Daniel Webster* (EBF)
	Webster's Sacrifice To Save the Union (from the "You Are There" series) (MGHT)

Wilson	*President Woodrow Wilson (I, II)* (SAUDEK) *Wilson's Fight for Peace* (MGHT) *Woodrow Wilson: Spokesman for Tomorrow* (MGHT)

Leaders (General)

In Search of Peace (USDS)
News Parade (separate films for each year since 1937) (CASTLE)

Musicians

Beethoven	*Beethoven and His Music* (CORF)
Brahms	*Brahms and His Music* (CORF)
Foster	*Dear Friends and Gentle Hearts* (IDEAL) *Stephen Foster and His Songs* (CORF)
Handel	*Handel and His Music* (CORF)
Liszt	*Liszt and His Music* (CORF)
Mozart	*Mozart and His Music* (CORF)
Sousa	*Marching Along with Sousa* (UWF)

Philosophers

Aristotle	*Aristotle and the Scientific Method* (CORF)
Russell	*Bertrand Russell* (EBF)
Socrates	*The Death of Socrates* (from the "You Are There" series) (MGHT)

Scientists (Specific)

Archimedes	*Archimedes' Principle* (EBF)
Burbank	*Luther Burbank* (PATHE)
Carver	*George Washington Carver* (EBF)
Galileo	*Galileo* (CORF)
Newton	*Isaac Newton* (CORF)
Pasteur	*Story of Louis Pasteur (I, II)* (TFC)

Scientists (General)

Challenge of Outer Space (I, II) (NF)
Man and the Moon (DISNEY)
Science and Superstition (CORF)
Science in Space (MGHT)
Scientific Method (EBF)
Scientific Method in Action (IFB)

Industralists

Carnegie	*Andrew Carnegie* (EBF)
Sloan	*Alfred P. Sloan, Jr.* (EBF)

Educators

Challenge in the Classroom
Crandall — *Prudence Crandall* (SAUDEK)
Ely — *Richard T. Ely (I, II)* (SAUDEK)
Mann — *Horace Mann* (EBF)

Sportsmen

Campbell — *Sir Malcolm: Man Against Time* (STAR)
Gehrig — *Lou Gehrig: King of Diamonds* (STAR)
Jones — *Bobby Jones: "Old Man Par"* (STAR)
Mack — *Connie Mack: Mr. Baseball* (STAR)
Rockne — *Knute Rockne: The Rock of Notre Dame* (STAR)

General (Ideas and Creativity)

Boy Creates Toy (EBF)
Boy of Renaissance Italy (CORF)
Forty Centuries (PIC)

Films for Teachers

Creating Instructional Materials
The Creative Process and Teaching (kinescope)
How the Historian Asks Questions
How the Historian Classifies Information
How the Historian Deals with Mind Set
How the Historian Decides What Is a Fact
How the Historian Proves a Hypothesis
Learning Is Creation (kinescope)
Order-Disorder: Ingredients of the Creative Process (kinescope)
Problem Method: Part I, Defining the Problem and Gathering Information
Problem Method: Part II, Using the Information To Solve the Problem

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